16-Sound Music Box Electronic DIY Kits

Ⅰ. Introduction

The 16-Sound Music Box Kits is designed to make you enjoy and love the joy of DIY Electronics. You can install the kits to an emulational music box with 16 different kinds of analog sounds. It is not only an electronic toy, and also can be used as a doorbell or an alarm, and so on.

Ⅱ. Parameter

Operating Voltage: 4.5-5V
PCB Size: 1.9in (length) x 1.8in (wide)
Control Mode: Manual Coding + External Coding

Ⅲ. Principle

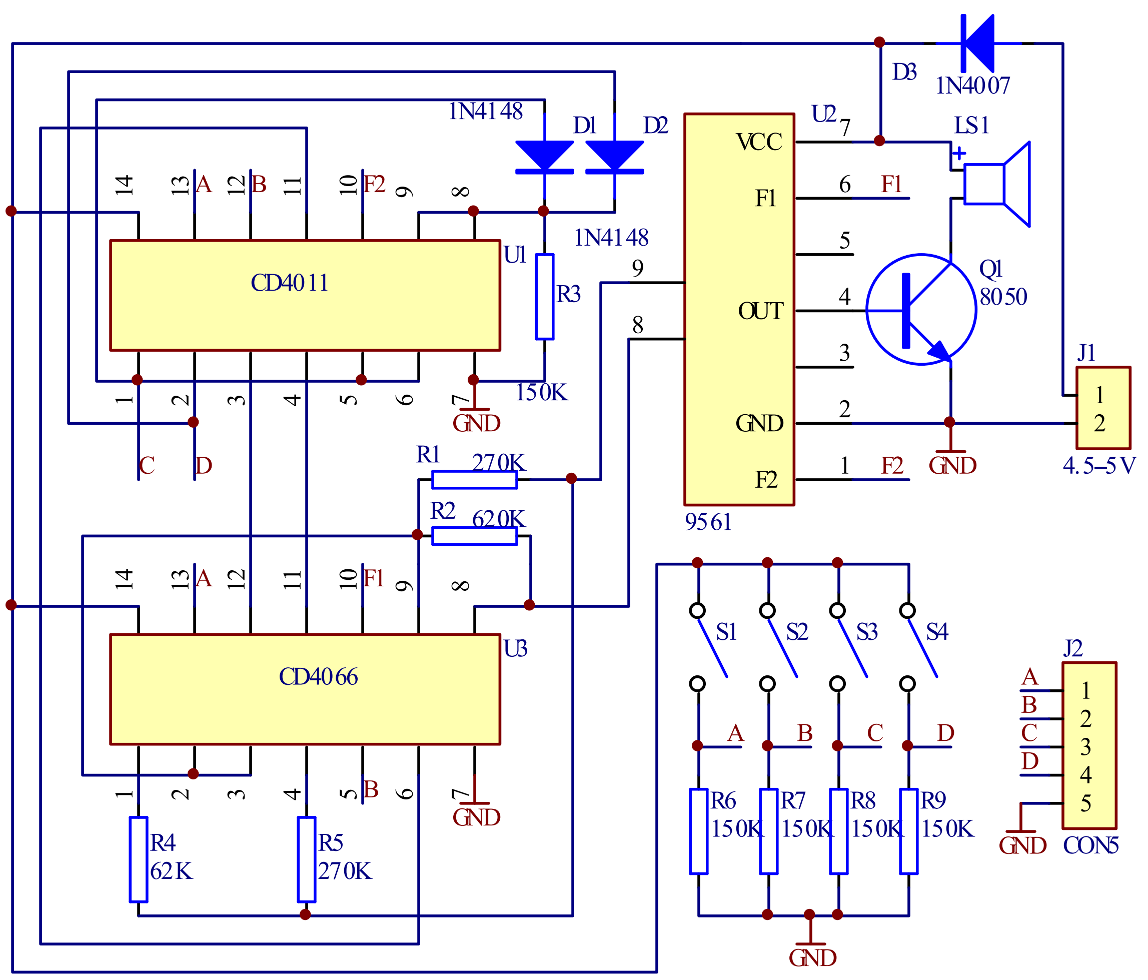
The 16-Sound Music Box based on using the 9561 integrated circuits as the whole circuit's core, encoding and controlling 9561's working condition with 4 bit binary code, and then produces 16 different analog sounds. The whole circuit consists of sound generation circuits, basic control circuits, additional control circuits, and binary coding circuits.

1. **Sound generation circuits**, was composed of U2 9561, audion Q1 and passive buzzer LS1.
2. **Basic control circuits**, with two binary digital control U3 of two selected the four kinds of working condition, make it produce four basic acoustics as required.
3. **Additional control circuits**, using the four states of two binary digital resistor R1, R2, R4, R5 produce a combination of four different to change 9561 external vibration resistance value, which changes the oscillation parameters, the change of the oscillation parameters, is not only changed the oscillation frequency, and derive a lot of new sound.

Note: Combine basic control circuits and the additional control circuits to constitute A complete control circuit which is controlled by A B C D four bit binary encoding to make 9561 produce 16 different sounds.

4. **Binary coding circuits**, the switch S1-S4, resistance R6-R9 etc binary encoder. S1, S2, S3, S4, corresponding binary digital A, B, C, D four. Switch to stir to 0, switch to stir to 1. Make up A, B, C, D four binary digital voice through control part 9561.

Ⅳ. Schematic Diagram



Ⅴ. 16 kinds of Sounds and The Code

	Code				Sound Effects
	A	B	C	D	
1	0	0	0	0	Machine Guns
2	0	0	0	1	Fire Engine Sound
3	0	0	1	0	Ambulance Voice

4	0	0	1	1	Police Siren Sound
5	0	1	0	0	Cricket Sound
6	0	1	0	1	Alarm Song
7	0	1	1	0	Electronic Signal Sound
8	0	1	1	1	Bird Call
9	1	0	0	0	Chirping
10	1	0	0	1	Whistle
11	1	0	1	0	Telegram Sound
12	1	0	1	1	Birds Singing Sound
13	1	1	0	0	Heavy Machine Gun Sound
14	1	1	0	1	Hooter Voice
15	1	1	1	0	Bass Sound
16	1	1	1	1	Passing-by Racecar Sound

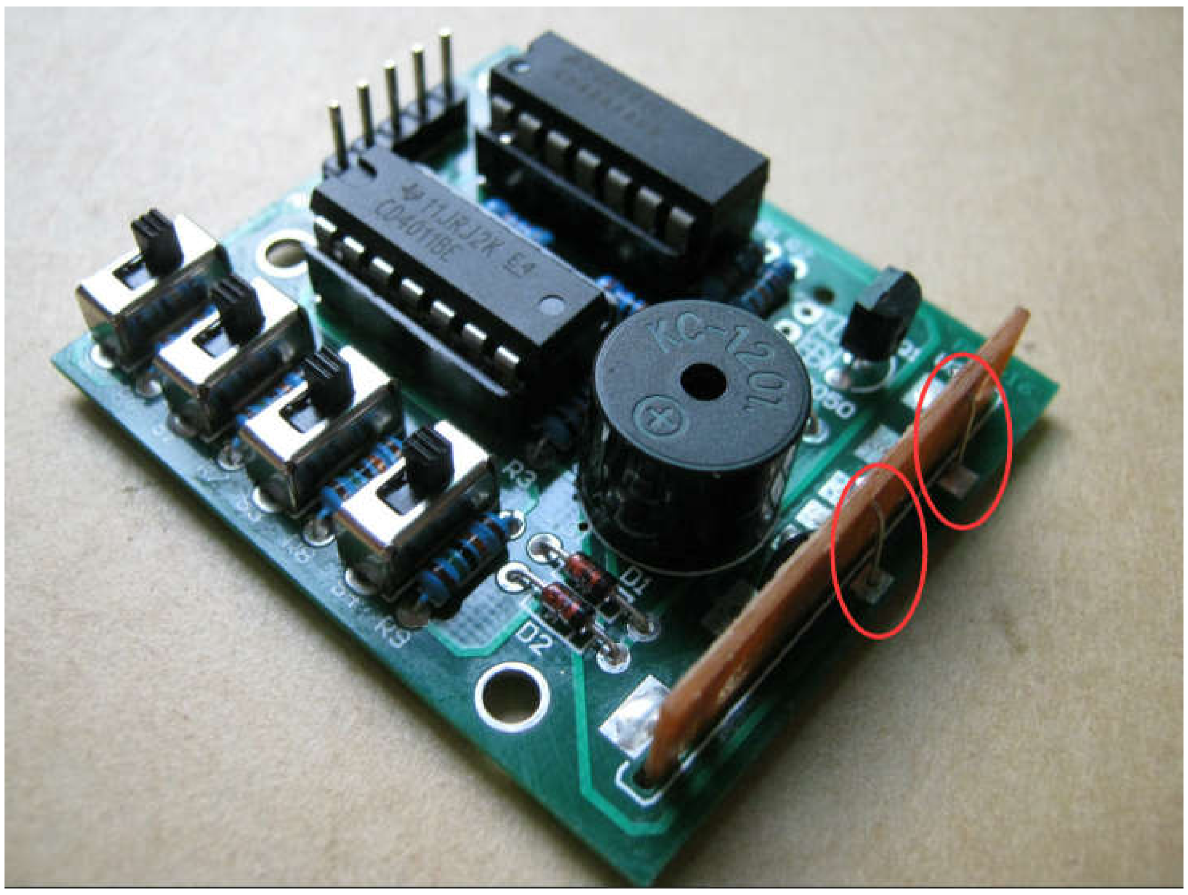
Ⅵ. Components List in The Package

NO.	Component Name	Parameter	Mark Number	QTY
1	Resistor	62K	R4	1
2		150K	R3 R6--R9	5
3		270K	R1 R5	2
4		620K	R2	1
5	Diode	1N4007	D3	1
6		1N4148	D1 D2	2
7	Audion	S8050	Q1	1
8	Buzzer	5V	LS1	1
9	Switch	1P-2T	S1--S4	4
10	Integrated Circuit	CD4011	U1	1
11		CD4066	U3	1
12		9561	U2	1
13	Sockets for ICs	DIP14	U1 U3	2
14	Extension Socket	SIP5	J1	1
15	PCB Board	1.9*1.6in	FR-4 Two-sided	1
16	Instruction Manual	A4	1	1

NOTE: Users can complete the installation under the instruction of PCB silk screen and components listed.

Ⅶ. Installation Steps

Installation Method: **Install the smaller and shorter components first, then install the relatively bigger and higher components with larger volume.**
Step 1: Install the resistors
Step 2: Install the diodes
Step 3: Install the chip extension socket
Step 4: Install the audion
Step 5: Install the 9561 chip
Note: While installing the 9561 chip, in addition to soldering its own solder joints, the 9561 chip ALSO needs to be soldered to the underlying motherboard with two metal wires (please see the following figure). You can use the superfluous metal pins cut from other components as the connecting metal wire.



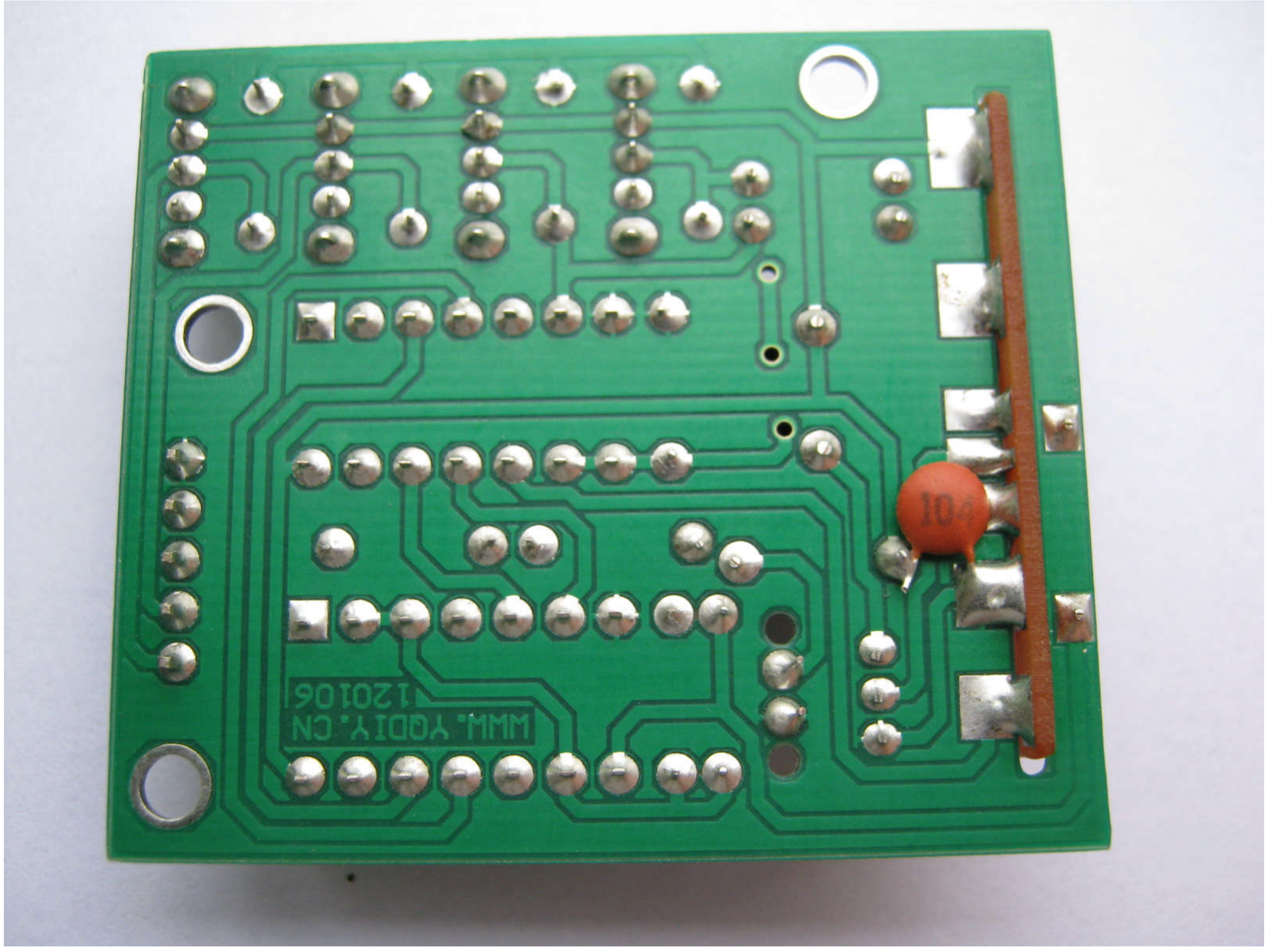
Step 6: Install 4 toggle switches and buzzer
Step 7: Installing CD4011 chip & CD4066 chip. (Solder the sockets for ICs first, and then insert the chips into the socket.)
Step 8: Installation Complete.
Note: 1) The diode, audion, buzzer and chips all have directions. Do not install them in reverse direction. Make sure all the components were soldered at right place in the right direction refer to the pictures.
2) Pay attention to the direction when connecting the finished product to the power. (The power is not included in the package!).

Ⅷ. Finished Product Display

Front:



Back:



Ⅸ. More Tips About The Soldering Work

1. More tips about the DIY soldering that will directly affect the performance effect of the finished product as followed:

1). Make sure that all the components were soldered at right place in the right direction.

2). Make sure bonding pad not peel off and no pseudo /float soldering. (If it's not, you can resolder it or reconnect adjacent components with superfluous metal pins to work things out.)

3). The soldering iron mustn't be contacted with the components more than two seconds, or the high temperature of the soldering iron will damage the components.

4). If the soldering failed, it can be modified through sucking out the components and re-soldering by means of a solder sucker.

2. Tips about DIY Electronics

This product comes to you is DIY kits that needs to be installed, not the finished product! Read the product instruction carefully before installing. And DIY Electronics Operation is a practice activity that **requires certain foundation** of basic electronic theoretical knowledge and welding and hands-on ability. We can’t guarantee that all our friends will DIY successfully due to the varying learning phase.

We pledge seriously to you: We could fully satisfy you with our quality products, high-efficiency logistics and perfect after-sale service! We will **do our utmost to assist you** to complete the installation. Your satisfaction is our commitment.

If the finished product does not achieve the effect we described or you have any questions or problems with our product or the transaction unfortunately, **don't rush to give us a negative feedback** out of anger and impulse, please do not hesitate to **contact us** directly for further help.